Canadian Centre on Substance Use and Addiction

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COVID-19 and Cannabis Smoking and Vaping: Four Things You Should Know

With the growing attention being given to the medical effects of cannabis, there is good deal of inaccurate information circulating on the Internet and social media about the potential positive effects of tetrahydrocannabinol (THC) and cannabidiol (CBD), the two major compounds in cannabis, on COVID-19. However, there is no scientific evidence that demonstrates the benefits of either THC or CBD in preventing or treating COVID-19. On the contrary, the evidence shows that inhaling cannabis smoke, as with smoke from other sources such as tobacco, can have negative effects on the respiratory system. A compromised respiratory system might, in turn, increase susceptibility to COVID-19 and worsen the respiratory symptoms of the disease among those infected. For instance, a recent study evaluating the risk factors leading to COVID-19 complications in 78 cases of COVID-19-induced pneumonia showed that people who smoke were 14 times more likely to develop COVID-19 complications such as pneumonia compared to people who do not smoke (Liu et al., 2020).

Coronavirus disease 2019 (COVID-19) is a novel infectious respiratory illness first identified in humans in December 2019 in Wuhan, Hubei, China. It is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infecting the human respiratory tract. SARS-CoV-2 originates from mammals other than humans. SARS-CoV-2 causes mild to moderate respiratory illness in the majority of people. However, there is an increased risk of more severe symptoms and deaths in vulnerable people, such as older adults (aged 65 and older), people with compromised immune systems and people who have underlying health issues, such as diabetes, cancer, cardiovascular disease and respiratory conditions (Health Canada, 2020; National Institute on Drug Abuse, 2020).

Further studies are needed to determine the extent to which cannabis smoking (or vaping) can also represent a risk factor for COVID-19-related respiratory complications.

Here are four important things you should know about COVID-19 and cannabis smoking and cannabis vaping:

1. **Cannabis smoke contains many chemicals and fine particles** that are known to be toxic and carcinogenic, and to cause genetic mutations (Moir et al., 2008; Manolis, Manolis, & Manolis, 2019). These chemicals are further known to cause cardiovascular and respiratory diseases and cardiovascular morbidity and mortality (Brook et al., 2010; Pope et al., 2009; Manolis et al., 2019). When smoking cannabis, using either a joint, a bong or a pipe, individuals tend to inhale more deeply and to keep the smoke in their lungs for longer. These behaviours are intended to expose the respiratory system to greater quantities of the psychoactive ingredients in cannabis, but also result in greater exposure to toxins and chemicals that can irritate respiratory tissue (Manolis et al., 2019).
2. **Cannabis smoking can have negative impacts on lung health.** Cannabis smoking is related to a greater incidence of chronic cough and phlegm production (National Academies of Sciences, Engineering, and Medicine [NASEM], 2017). Other respiratory symptoms, including wheezing, sore throat, chest tightness and hoarse voice, have been extensively reported with regular and heavy use of cannabis (Hancox, Shin, Gray, Poulton, & Sears, 2015; Moore, Augustson, Moser, & Budney, 2005; Taylor, Poulton, Moffit, Ramankutty, & Sears, 2000; Tetrault, et al., 2007). Long-

term cannabis smoking can worsen respiratory symptoms and lead to more frequent episodes of chronic bronchitis (NASEM, 2017). There is emerging evidence that quitting cannabis smoking can reverse some of the negative respiratory symptoms associated with its use (NASEM, 2017).

3. **THC from cannabis smoke or in other forms can inhibit the ability of the immune system** to protect the body from foreign pathogens, thus increasing susceptibility to infections. For example, growing evidence from preclinical studies in rodents and monkeys has shown that THC is able to suppress the ability of immune system cells and "immune messengers" to modulate an adequate immune response (Eisenstein & Meissler (2015) against foreign pathogens such as viruses. In humans, some studies have shown that THC can inhibit the functioning of several types of immune cells in the lungs (Shay et al., 2003; Tashkin & Roth, 2006), an effect that has been suggested to alter the immune system defences of lungs and increases susceptibility to infections. There have not been many studies examining the effects of THC and other cannabinoids on the immune system in humans (NASEM, 2017) and more studies are needed to confirm the effects of THC on immune competencies in both healthy and compromised individuals (NASEM, 2017). However, the large body of preclinical evidence supports the hypothesis that THC has a potential affect on immune functioning.
4. **Vaping of unregulated cannabis extracts can lead to severe lung and pulmonary illnesses.** Recently, cannabis vaping products that were mostly purchased on the illegal market have been associated with severe pulmonary illness, which in some cases resulted in death (Canadian Centre on Substance Use and Addiction, 2019; Centers for Disease Control and Prevention, 2020; Health Canada, 2019). While it is unknown which substance or substances in these products led to these outcomes, the primary agent appears to be vitamin E, which is used as a thickener in cannabinoid-infused oils. A recent study has shown that heating vitamin E acetate can produce carcinogenic alkenes, benzene and toxic ketene gas (Wu & O'Shea, 2020), chemicals that potentially played a role in the pulmonary illnesses associated with vaping unregulated cannabis extracts containing high levels of vitamin E acetate.

Eight Ways to Reduce Your Health Risks

1. Do not share joints, vaping devices and bongs.
2. Wash your hands before putting any type of cannabis product in your mouth.
3. If possible, try to limit your cannabis use to once a week.
4. Avoid taking deep inhalations and try not to hold your breathe.
5. Purchase your cannabis products from licensed and regulated retailers.
6. Use products that contain no more than 100 mg/g (10%) of THC content.
7. Remember that cannabis can interact with your medication. Speak to your heathcare provider before using cannabis.
8. If you are using cannabis for medical purpose, consult your healthcare provider with any questions you may have about medical cannabis use during the COVID-19 pandemic.

For more information, visit https://www.ccsa.ca/cannabis

Conclusions

There is emerging evidence suggesting that cannabis smoking can have negative consequences on an individual's respiratory system and immune competences. There is no evidence that smoking or vaping cannabis can prevent, alleviate or treat COVID-19 symptoms. Cannabis smoking or vaping could worsen the respiratory symptoms of COVID-19. The National Institute on Drug Abuse in the United States has recently warned that COVID-19 could be a serious danger for populations with substance use disorders, including people who smoke or vape tobacco or cannabis (National Institute on Drug Abuse, 2020). Rates of cannabis use among adults aged 65 years and older has been rising in Canada. Older adults are at greater risk of developing respiratory and cardiovascular complications, and the co-occurrence of cannabis smoking and COVID-19 could increase the risk of these complications. Impaired lung function could put people who smoke or vape cannabis at risk for serious complications from COVID-19. The extent to which cannabis smoke impacts respiratory and immune health in humans is currently not well-known. However, in light of the ongoing COVID-19 pandemic, any behaviours that might put an individual's health at risk should be carefully considered; this includes smoking and vaping cannabis.

More information about cannabis and its effects on the lungs and heart is coming soon in CCSA's Clearing the Smoke on Cannabis Series.

Complementary Resources

Health Services and Mental Health Support Resources

- ConnexOntario, Addiction, Mental Health, and Problem Gambling Treatment Service: https://www.connexontario.ca/
- Ontario Telemedicine Network, Clinical Resources to Support COVID-19 and the Use of Virtual Care: https://otn.ca/covid-19/
- Telehealth Ontario, Get Medical Advice: https://www.ontario.ca/page/get-medical-advice-telehealth-ontario?_ga=1.82142430.912117515.1445957549
- CannabisRehab.org, Online Rehab Group: https://www.cannabisrehab.org/

Cannabis Resources

- Canadian Institute for Substance Use Research, Safer Cannabis Use: https://www.heretohelp.bc.ca/infosheet/safer-cannabis-use-marijuana-hash-hash-oil
- Centre for Addiction and Mental Health, Canada's Lower-Risk Cannabis Use Guidelines: https://www.camh.ca/-/media/files/pdfs---reports-and-books---research/canadas-lower-risk-guidelines-cannabis-pdf.pdf
- Government of Canada, Cannabis in Canada: Get the facts: https://www.canada.ca/en/services/health/campaigns/cannabis.html

COVID-19 Resources

- Government of Canada, Coronavirus disease (COVIC-19): https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19.html

- Substance Abuse and Mental Health Services Administration, Considerations for the Care and Treatment of Mental and Substance Use Disorders in the COVID-19 Epidemic: https://www.samhsa.gov/sites/default/files/considerations-care-treatment-mental-substance-use-disorders-covid19.pdf
- National Institute on Drug Abuse, COVID-19: Potential Implications for Individuals with Substance Use Disorders: https://www.drugabuse.gov/about-nida/noras-blog/2020/03/covid-19-potential-implications-individuals-substance-use-disorders
- World Health Organization, Rolling updates on coronavirus disease (COVID-19): https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen
- Centers for Disease Control and Prevention, Coronavirus (COVID-19): https://www.cdc.gov/coronavirus/2019-ncov/index.html
- National Institutes of Health, Coronavirus disease 2019: https://www.nih.gov/health-information/coronavirus#!/detail/403327

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